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TRAMMEL NETS

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I. General Information

Trammel nets have three panels of netting which are suspended from a float line and a single lead line. The two outer panels are a larger mesh than the inner panel. The inner panel is deeper than the outer panels and hangs loosely between the outer panels. Fish are either gilled in the mesh or become bagged in the smaller mesh. Trammel nets are more selective for fish with rough surfaces. Trammel nets, generally, are less injurious to fish than gill nets. The same biases exist with trammel nets as with gill nets; however, trammel nets are less size selective (Nielsen and Johnson 1983). Removed size range and number of species captured in segments 2 and 3, the Liebelt and Ruggles citation.

II. Materials

- A. Christiansen Co. trammel net orders should be directed to Bruce Sederberg, President, H. Christiansen Co., 22 North 2nd Ave West, Duluth, MN 55802 or called at 218-722-1142 or 1-800-372-1142.
- B. Trammel nets will be made of multifilament nylon netting with the inner wall 8 feet deep (2.4 m) and outer wall 6 feet (1.8 m) deep, 75 feet (22.9 m) long with 1-inch (2.5 cm) bar mesh for the inner panel of no. 139 twine, 8-inch (20.3 cm) bar mesh for the outer panel of no. 9 twine, with 3/8" (9.5 mm) to 1/2" (12.7 mm) foam floatline, and 30 pound (13.6 kg) lead line. Each net will cost approximately \$99.
- C. Additional sash weights may be required, weights should be between 113 and 227 grams (0.25-0.5 lbs) with attachment rings.
- D. Snap link carabiners (available at most local hardware stores) will be used to connect the sash weights to the trammel net lead line.
- E. 2 Inflatable buoys with 23 to 33 cm diameter (9"-13") can be ordered from Memphis Net & Twine Co.
- F. Live car or other suitable holding pen for fish.

III. Repair materials and methods.

- A. Twine for inner panel and outer panel, No. 139 and 9 nylon twines.
- B. Small netting needle and large netting needle
- C. An area to hang net to work.
- D. Outer panels should be repaired with no. 9 twine following procedures outlined by Stacy V. Gebhards in the Fisheries Techniques book chapter 6 Appendix (Nielsen and Johnson 1983). Outer panels should be rebuilt rather than replaced. The inner panel which is made of one inch mesh and of greater depth than the outer panel can be repaired by simply trimming the broken mesh fringes and sewing the tear together with no. 139 twine. If the hole is small reconstruction is possible with weaving, if one would like to take the time to do so. Cut nets can be sewn together if both ends of the net were retrieved. A net with more than 25% damage must be repaired before reusing. Removed lead and floatline use for gill net statement.

IV. Habitats Trammel Nets will be used to sample.

Trammel netting will be conducted in large tributary mouths, deep secondary connected channels, outside bends, channel borders on inside bends, and main channel crossovers. In upper river segments (1 - 16), 3 drifts will be conducted at each sampling site (Table 1). In lower river segments (17 - 27) two drifts will be performed in channel crossovers and outside bends. Three drifts will be performed at all other locations if velocities permit.

V. Distance and time measurements.

- A. Each subsample drift will be 300 meters long or less (minimum 75m). Distance will be defined by setting an anchored line with a float attached to a 300 meter floatline with three additional small floats marking increments at 75 (246 ft), 150 (492 ft), and 225 meters (738 ft) or by using a survey level. Distance will be estimated using a line and float in the event a net is snagged after drifting the required 75 meters. CPUE will be fish per 100 meters.
- B. Time will be recorded to the nearest minute using a stopwatch. Time will start when the entire net is deployed from the boat and stop upon initiation of retrieval (Dryer 1996).

VI. Methods

- A. Attach floats to net. Bullet or ball floats and 9 to 15 m (30 to 50 feet) of 3/8" (9.5 mm) to 1/2" (12.7 mm) float rope will be attached to each end of the float line with

carabineers. One end will be attached to the boat or held and the other end will be allowed to float. Additional line is used to visualize net location and maneuver the net in water with various water velocities such as outside bends and inside bends. One end of the net can be released and the opposing line retrieved to maneuver the net from the other end.

- B. Determine need for additional sash weight. If net doesn't descend as it is deployed or becomes twisted due to high flow turning the net add sash weights to remedy problem. Sash weights will be added as needed to keep the net on the bottom and perpendicular to current while still allowing the net to drift. Sash weights between 0.25 (113 g) and 0.5 pound (227 g) should be evenly distributed along the length of the net and attached with snap link carabiniers to the lead line. Start adding weights with one on each end and one in the middle with additional weight added as needed.
- C. Deployment of net. Trammel nets will be deployed from the bow of the boat as the boat moves in reverse from an estimated distance point upstream from the upstream anchored float marker. The net will be drifted perpendicular to the current. The net should be dropped above the upstream marker so it hits bottom near the first float, this is a judgement call based on water velocity, depth, and net descent rate. The drift will end as the net passes the last float. The net can be pulled into the boat over the side or the bow. If more than 20 fish are collected in a net, a net tub filled with water should be used to hold the trapped fish and net. Entangled fish will be held in water as the fisheries crew picks fish out. Once fish are removed they will be placed in a live car before weighing and measuring.
- D. Snagged nets will be divided into two categories; resample or complete. If a net drifts less than 75 meters (246 ft) the sample must not be counted. However, fish collected will be used for age analysis, therefore, weights and lengths should be recorded and aging structures removed. These fish should not be included in CPUE calculations. Nets which are snagged after the first 75 meters (246 ft) will be counted and distance drifted will be estimated to the nearest 25 meters (82 ft) or nearest float. The fish will be used for age analysis and CPUE calculations with all required information recorded.
- E. Dangers of Trammel netting and corrections for those situations. Caution is required when removing a net from a snag to prevent sinking the boat. The boat should never have the stern forced against the current when pulling a net from a snag as water may wash into the boat sinking it. Position and hold the bow upstream while using forward thrust to free the net. Never try to free the net using reverse gear with the stern positioned upstream. Do not pull so hard as to force the bow into the water. If a net is snagged and will not pop loose after repeated attempts to pull it free, cut the net. When cutting the net hold onto both ends of the net if possible so most of the net can be retrieved. Occasionally enough net can be retrieved to rebuild the net by

splicing ends.

Table 1. Locations to be sampled by benthic trawl by habitat type. Location 1, 2, and 3 are relative and order should be determined randomly. Channel width and top, middle and bottom of bends are estimated visually or from maps. Location of subsample two should be determined randomly in the lower river where three subsamples are not conducted.

Trawl location Habitat	Location 1	Location 2	Location 3
CHXO	Thalweg, middle 1/3 of channel crossover*	Thalweg, right 1/3 of channel crossover*	Thalweg, left 1/3 of channel cross-over*
TRM-LRGE	Thalweg 300 m upstream from the mouth	Offset from thalweg towards right bank 300 m upstream from mouth	Offset from thalweg towards left bank 300 m upstream from mouth
SCC-DEEP	Thalweg, top 1/3 of channel	Thalweg, middle 1/3 of channel	Thalweg, bottom 1/3 of channel
OSB	Top 1/3 of bend*	Middle 1/3 of bend*	Bottom 1/3 of bend*
ISB-CHNB	Top 1/3 of bend	Middle 1/3 of bend	Bottom 1/3 of bend

* Channel Cross-Overs and Outside bends will only have 2 subsamples for segments 17-27, the 2 subsamples should be randomly selected from the three locations

References

- Dryer, M. February 1996. Protocol on collecting, tagging, holding, transporting, and data recording for researchers and managers handling pallid sturgeon. U.S. Fish and Wildlife Service. Bismarck, North Dakota.
- Nielsen, A. L., Johnson, L. D. 1985. Fisheries techniques. American Fisheries Society, Bethesda, Maryland.

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